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(54) **METHODS AND APPARATUS FOR SPECTRAL LUMINESCENCE MEASUREMENT**

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See application file for complete search history.

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(57) **ABSTRACT**

One embodiment relates to a computer-implemented method of processing spectral luminescence mapping data obtained from a substrate, the substrate having an epitaxial layer stack that includes a multiple quantum well. A spectral luminescence and an epi thickness at a location on the substrate are obtained. A spectral modulation for the location may be computed given the epi thickness and material indices of refraction. The underlying luminescence spectrum may then be generated by dividing the measured spectral luminescence by the spectral modulation. Subsequently, a peak wavelength and other parameters may be obtained from the underlying luminescence spectrum. In another embodiment, the underlying luminescence spectrum may be determined, without the epi thickness measurement, using a self-consistent technique. Another embodiment relates to an apparatus for spectral luminescence mapping and epitaxial thickness measurement. Other embodiments, aspects and features are also disclosed.

14 Claims, 7 Drawing Sheets